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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/816,302

04/02/2004

Carl K. Sawtell

8583

7590

11/30/2005

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EXAMINER

MILLER, PATRICK L

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/816,302

Applicant(s)

SAWTELL ET AL.

Examiner

Patrick Miller

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)     | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. Please delete the words after the canceled claims (claims 1-6, so they are not inadvertently written on the patent should the newly added claims be found allowable; leave “(Canceled)”).

#### ***Claim Objections***

2. Claims 7-18 objected to because of the following informalities: see bullet(s) below.

Appropriate correction is required.

- Claim 7 recites, “a feedback digital signal” (l. 17). It is unclear whether this feedback digital signal is the same as the “digital output” from the detecting device (l. 7). Please clarify.
- Claim 13 recites, “the noise” (l. 12). Lack of antecedent basis for this term.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 13-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
  - Claim 13 states that one of the physical parameters is “illumination” (ll. 10-11). The examiner cannot find support for this feature in either the original claims or the original specification.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7-11 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,153,997) in view of Bibyk (6,202,198).

- With respect to claim 7, Kobayashi et al. discloses a servo loop comprising: a microcontroller device (Fig. 4, #s 73, 74, 63, 64, 83); a digital to analog converter (DAC) (Fig. 4, #66); the DAC receives a digital input from the microcontroller (Fig. 4, implied that the signal #77 is a digital signal since it is input to a DAC) and an analog output to a motor actuator (Fig. 4, output of #66 is analog and is input to the #31, which is interpreted as the actuator); a motor coupled to the actuator (Fig. 4, #6 is a VCM and is coupled to #31); a detecting device having a digital output, the digital output coupled to the microcontroller (Fig. 1, #9 is the analog output that is coupled to the microcontroller via #s 10, 11, and 13); the detecting device detects the position/velocity/acceleration (Fig. 1, output is the position); the actuator delivers electrical energy to the motor (Fig. 1, #31 is power amplifier, which supplies electrical energy to the motor); and the microcontroller receives a commanding digital signal from a commanding source and the feedback digital output signal from the detecting device and processes the digital data to drive the motor actuator in response to the digital data to control the

position/velocity/acceleration (Fig. 4, command signal is from #72 and feedback is the position signal from #72).

- With respect to claim 13, Kobayashi et al. discloses a method for a system comprising: measuring a value of physical parameters, where the physical parameters consist of either position, velocity, acceleration, pressure, temperature, or illumination (Fig. 1, output is the position); generating a motor control servo signal responsive to the difference between the value of the physical parameter and a desired value (Fig. 4, #78 is the difference between position command and position feedback); generating an analog signal (Fig. 4, #66 generates the analog signal); controlling the system by means of driving a motor in response to the analog signal (Fig. 4, output of #66 drives the motor via the power amplifier); and a filter that filters noise from the analog signal output from the DAC (Fig. 4, #67).
- Kobayashi et al. does not disclose the DAC is an oversampling DAC, comprising a digital oversampling modulator, whose output signal is a bitstream analog signal; and a noise of the servo loop is reduced by noise-shaping the oversampled bitstream analog signal.
- Bibyk discloses a sigma-delta converter (oversampling DAC combined with an oversampling modulator) (col. 2, ll. 9-20, 26-29), whose output signal is a bitstream analog signal (col. 19, ll. 17-19), and the noise is reduced by noise-shaping the oversampled bitstream analog signal (col. 2, ll. 27; expanding interpolation filter is interpreted as reducing noise). The examiner interprets this to mean that the DAC displayed in Figure 1, is a sigma-delta DAC. Additionally, Bibyk discloses the sigma-

delta converter (the DAC) used in areas such as speech and video systems (col. 2, ll. 23-24). This does not mean that a sigma delta converter can only be used for audio and video signals, but rather, that a sigma delta converter can be used in speech and video systems. Thus, when Bibyk speaks of a physical result or phenomenon being the motion of a motor or loudspeaker (col. 1, ll. 55-57), this means that the motor or loudspeaker is simply part of the speech or video system. Kobayashi et al. discloses a disk apparatus, which would be considered part of a video system (e.g. disk apparatus in a DVD system). The motivation to use a sigma-delta DAC is to provide the advantage of combining oversampling with decimation filtering (col. 2, ll. 18-20).

- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to make the DAC of Kobayashi et al. an oversampling DAC, comprising a digital oversampling modulator, whose output signal is a bitstream analog signal, thereby providing the advantage of combining oversampling with decimation filtering, as taught by Bibyk.
- With respect to claim 8, Kobayashi et al. disclose that the motor is a VCM (col. 4, ll. 37, Fig. 1, #6).
- With respect to claims 9 and 15, Kobayashi et al. disclose that the motor actuator is in an optical data storage device (col. 1, ll. 7).
- With respect to claims 10 and 16, Bibyk discloses the oversampling DAC is a sigma-delta bitstream DAC (col. 2, ll. 9-20, 26-29; col. 19, ll. 17-19).
- With respect to claims 11 and 17, Bibyk discloses the DAC is implemented in hardware within the microcontroller (col. 2, ll. 9-13; 30-36).

Art Unit: 2837

- With respect to claim 14, Kobayashi et al. discloses the system is a hard disk drive data read and write head positioning system (cols. 2/3, ll. 32-67/1-26).
5. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. in view of Bibyk as applied to claims 7 and 13 above, and further in view of Contreras (6,154,017).
- Kobayashi et al. and Bibyk do not disclose the limitations of claims 12 and 18.
  - Contreras teaches that DACs can be implemented in either hardware or software (col. 5, ll. 18-20). The motivation to implement a DAC in software is so that it may be reprogrammed.
  - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that Kobayashi et al. and Bibyk's DAC, which is implemented in hardware, could be implemented in software, thereby providing the advantage of allowing the DAC to be reprogrammed, as taught by Contreras.

Art Unit: 2837

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pm  
November 26, 2005

*Patrick Miller*  
Patrick Miller  
Examiner  
Art Unit 2837

*David Martin*  
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